

03/03/14 Agenda

- Answer Keys
- Warm Up
- Retake Information
 - Remediation Packet is on my web site
 - It's due by March 3rd (today)
 - Complete it, Reflection Sheet, & Missing Homework
 - You have 1 week after submitting it to take your retest
- Section 7.4 - Division Properties
- Homework
 - Worksheet 7.4 - Division Properties

Warm Up



Put your name on a slip of paper.

Without using a calculator, simplify:

$$\frac{\cancel{7} \cdot \cancel{5} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{4} \cdot \cancel{9} \cdot \cancel{8} \cdot 10}{\cancel{2} \cdot \cancel{3} \cdot \cancel{4} \cdot \cancel{5} \cdot 6 \cdot \cancel{7} \cdot \cancel{8} \cdot \cancel{9}} = \frac{10}{6}$$

$$\frac{2 \cdot 3 \cdot 4 \cdot 5 \cdot 7 \cdot 8 \cdot 9 \cdot 10}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9}$$

$$\frac{2}{2} \cdot \frac{3}{3} \cdot \frac{4}{4} \cdot \frac{5}{5} \cdot \frac{1}{6} \cdot \frac{7}{7} \cdot \frac{8}{8} \cdot \frac{9}{9} \cdot \frac{10}{1}$$
$$1 \cdot 1 \cdot 1 \cdot 1 \cdot \frac{1}{6} \cdot 1 \cdot 1 \cdot 1 \cdot \frac{10}{1} = \frac{10}{6}$$
$$\frac{5}{3}$$

A little harder one:

$$\frac{\cancel{7} \cdot \cancel{10} \cdot \cancel{3} \cdot \cancel{12} \cdot \cancel{14} \cdot \cancel{9}}{\cancel{2} \cdot \cancel{3} \cdot \cancel{4} \cdot \cancel{5} \cdot \cancel{6} \cdot \cancel{7} \cdot \cancel{8} \cdot \cancel{9}} = \frac{7}{8}$$

Section 7.4 - Dividing Properties with Exponents

Target 7C

March 3, 2014

Goal: Be able to use the properties of dividing powers with the same base.

How do you simplify division with exponents?

Example: $\frac{4^5}{4^3} = \frac{4 \cdot 4 \cdot 4 \cdot 4 \cdot 4}{4 \cdot 4 \cdot 4 \cdot 1} = \frac{4 \cdot 4}{1} = 4^2 = 16$

What do you do with the exponents?

YOU SUBTRACT THEM!

Take Note

Property Dividing Powers With the Same Base

Words To divide powers with the same base, subtract the exponents.

Algebra $\frac{a^m}{a^n} = a^{m-n}$, where $a \neq 0$ and m and n are rational numbers

Examples $\frac{2^6}{2^2} = 2^{6-2} = 2^4$ $\frac{x^4}{x^7} = x^{4-7} = x^{-3} = \frac{1}{x^3}$ $\frac{s^3}{s^5} = s^{3-5} = s^{-2} = \frac{1}{s^2}$

Examples: Simplify the following:

$$\frac{7^5}{7^2} = 7^{5-2} = 7^3$$

$$\frac{p^6}{p^5} = p^{6-5} = p$$

$$\frac{x^6 y^9}{x^2 y^5} = x^{6-2} y^{9-5} = x^4 y^4$$

What if we have coefficients?

Example: $\frac{8a^2 b^3}{4ab^1} = \frac{8}{4} a^{2-1} b^{3-1} = 2ab^2$

DIVIDE LIKE NORMAL

Examples: Simplify the following:

$$\frac{36ab^8}{9b^2} = 4a^{1-0} b^{8-2} = 4ab^6$$

$$\frac{12v^6 w^7}{-4v^3 w^2} = -3v^{6-3} w^{7-2} = -3v^3 w^5$$

$$\frac{21m^{\frac{3}{2}}}{3m^{\frac{1}{2}}} = 7m^{\frac{3}{2}-\frac{1}{2}} = 7m^1 = 7m$$

Section 7.4 - Dividing Properties with Exponents

Target 7C

March 3, 2014

What if we have division raised to a power?

Example: $\left(\frac{x}{y}\right)^3 = \left(\frac{x}{y}\right)\left(\frac{x}{y}\right)\left(\frac{x}{y}\right) = \frac{x^3}{y^3}$

RAISE THE NUMERATOR AND DENOMINATOR TO THE POWER

Take note

Property Raising a Quotient to a Power

Words To raise a quotient to a power, raise the numerator and the denominator to the power and simplify.

Algebra $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$, where $a \neq 0$, $b \neq 0$, and n is a rational number

Examples $\left(\frac{3}{5}\right)^3 = \frac{3^3}{5^3} = \frac{27}{125}$ $\left(\frac{x}{y}\right)^5 = \frac{x^5}{y^5}$ $\left(\frac{a}{b}\right)^{\frac{1}{2}} = \frac{a^{\frac{1}{2}}}{b^{\frac{1}{2}}}$

Examples:

Simplify the following:

$$\left(\frac{3}{8}\right)^2 = \frac{3^2}{8^2} = \frac{9}{64}$$

$$\left(\frac{3x}{y}\right)^4 = \frac{3^4 x^4}{y^4} = \frac{81x^4}{y^4}$$

Let's put it all together!

#1 $\frac{6^7}{6^2}$

#7 $\frac{5x^8}{8x^7}$

$$\left(\frac{16x^4y^4}{4x^2y^1}\right)^3$$

$$(4x^{4-2}y^{4-1})^3$$

$$(4x^2y^3)^3$$

$$4^3x^6y^9$$

$$64x^6y^9$$

$$\left(\frac{-2a^3b^7}{a^2b^3}\right)^4$$

$$(-2a^{3-2}b^{7-3})^4$$

$$(-2a^1b^4)^4$$

$$(-2)^4a^4b^{16}$$

$$16a^4b^{16}$$

Section 7.3 - Multiplying Power to a Power

Target 7B

February 25, 2014

Summary of Rules ... so far:

take note

Property Multiplying Powers With the Same Base

Words To multiply powers with the same base, add the exponents.

Algebra $a^m \cdot a^n = a^{m+n}$, where $a \neq 0$ and m and n are rational numbers

Examples $4^{\frac{1}{3}} \cdot 4^{\frac{1}{3}} = 4^{\frac{1}{3} + \frac{1}{3}} = 4^{\frac{2}{3}}$ $b^7 \cdot b^{-4} = b^{7+(-4)} = b^3$

take note

Property Raising a Power to a Power

Words To raise a power to a power, multiply the exponents.

Algebra $(a^m)^n = a^{mn}$, where $a \neq 0$ and m and n are rational numbers

Examples $(5^4)^2 = 5^{4 \cdot 2} = 5^8$ $(m^3)^5 = m^{3 \cdot 5} = m^{15}$
 $(a^3)^2 = a^{3 \cdot 2} = a^6$ $(x^2)^5 = x^{2 \cdot 5} = x^{10}$

take note

Property Raising a Product to a Power

Words To raise a product to a power, raise each factor to the power and multiply.

Algebra $(ab)^n = a^n b^n$, where $a \neq 0$, $b \neq 0$, and n is a rational number

Examples $(3x)^4 = 3^4 x^4 = 81x^4$ $(4b)^{\frac{3}{2}} = 4^{\frac{3}{2}} b^{\frac{3}{2}} = 8b^{\frac{3}{2}}$

take note

Property Dividing Powers With the Same Base

Words To divide powers with the same base, subtract the exponents.

Algebra $\frac{a^m}{a^n} = a^{m-n}$, where $a \neq 0$ and m and n are rational numbers

Examples $\frac{2^6}{2^2} = 2^{6-2} = 2^4$ $\frac{x^4}{x^7} = x^{4-7} = x^{-3} = \frac{1}{x^3}$ $\frac{s^{\frac{3}{4}}}{s^{\frac{1}{2}}} = s^{\frac{3}{4} - \frac{1}{2}} = s^{\frac{3}{4} - \frac{2}{4}} = s^{\frac{1}{4}}$

take note

Property Raising a Quotient to a Power

Words To raise a quotient to a power, raise the numerator and the denominator to the power and simplify.

Algebra $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$, where $a \neq 0$, $b \neq 0$, and n is a rational number

Examples $\left(\frac{3}{5}\right)^3 = \frac{3^3}{5^3} = \frac{27}{125}$ $\left(\frac{x}{y}\right)^5 = \frac{x^5}{y^5}$ $\left(\frac{a}{b}\right)^{\frac{1}{2}} = \frac{a^{\frac{1}{2}}}{b^{\frac{1}{2}}}$